1/2 cl 1
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HAIR RINSE COMPOSITION

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[There are no amendments to this patent.]

Claims

1. A hair rinse composition containing an amine oxide represented by the following formula [I] and an amino acid with an isoelectric point of 7 or lower.

$$R^1\left(O(CH_2CH_2O)_m CH_2CH_2\right)_n \overset{\overset{R^2}{|}}{\underset{\underset{R^3}{|}}{N\rightarrow O}} \quad \cdots\cdots (I)$$

(where, R^1 represents a C12-22 alkyl group or alkenyl group; R^2 and R^3 represent a methyl group, ethyl group, hydroxyethyl group, or hydroxypropyl group; m is in the range of 1-10; and n is 0 or 1).

2. The hair rinse composition described in Claim 1 characterized by the fact that the weight ratio of the amine oxide to amino acid is in the range of 1:0.01-2.

3. The hair rinse composition described in Claim 1 or 2 characterized by the fact that the amine oxide and amino acid are dissolved or dispersed in water.

4. The hair rinse composition described in any of Claims 1-3 characterized by the fact that the concentration of the amine oxide is in the range of 0.5-10 wt%.

5. The hair rinse composition described in any of Claims 1-4 characterized by the fact that the amino acid is at least one selected from the group of glutamic acid, aspartic acid, serine, and glycine.

Detailed explanation of the invention

The present invention pertains to a hair rinse composition.

A hair rinse agent is required to soften hair, to make it easy to comb, to prevent static electricity, to make it look glossy, and to protect the hair surface. A cationic surfactant can be used to realize the aforementioned effects. A conventional hair rinse agent usually uses a cationic surfactant as the main component, in which moisture retaining agents, oils, etc. are added. Such hair rinse agent, however, is an irritant. The irritation becomes particularly serious when other alcohol-containing hair cosmetic products, such as hair tonic, are used on the rinsed hair. It is believed that the irritation is caused by the cationic surfactant used as the main component. Therefore, it is desired to develop a hair rinse agent which is less of an irritant but exhibits the same effects as a cationic surfactant.

The purpose of this invention is to solve the aforementioned problem by providing a hair rinse composition which is less of an irritant but has better performance than a conventional cationic surfactant and uses a specific amine oxide along with a specific amino acid.

The present invention provides a hair rinse composition containing an amine oxide represented by the following formula [I] and an amino acid with an isoelectric point of 7 or lower.

$$R^1[O(CH_2CH_2O)_m CH_2CH_2]_n \overset{\overset{R^2}{|}}{\underset{\underset{R^3}{|}}{N \rightarrow O}} \cdots\cdots (I)$$

(where, R^1 represents a C12-22 alkyl group or alkenyl group; R^2 and R^3 represent a methyl group, ethyl group, hydroxyethyl group, or hydroxypropyl group; m is in the range of 1-10; and n is 0 or 1).

In formula [I], examples of the C12-22 alkyl groups or alkenyl groups for R^1 used as the residue include a lauryl group, myristyl group, palmityl group, stearyl group, isostearyl group, behenyl group, oleyl group, mixed alkyl groups derived from alcohols synthesized using the oxo method, mixed alkyl groups derived from alcohols synthesized using the Ziegler method, and mixed alkyl groups derived from coconut oil, palm oil, beef tallow, etc. These groups can be used either alone or in a combination of several.

The amine oxide represented by formula [I] can be manufactured easily by oxidizing the corresponding tertiary amine.

The reason for the limitation on the number of carbon atoms in R^1 in formula [I] is that if the number of carbon atoms is less than 12, the water solubility becomes too high, and the rinsing effect disappears. On the other hand, if the number of carbon atoms is more than 22, the hair rinse composition cannot dissolve in water. The reason for the limitation on the number of moles of ethylene oxide added is that if the number of moles exceeds 10, the water solubility becomes too high, and the rinsing effect disappears.

Examples of amino acids with an isoelectric point of 7 or lower include glycine, alanine, valine, leucine, isoleucine, serine, threonine, phenyl alanine, tyrosine, tryptophane, cystine, cysteine, methionine, proline, hydroxyproline, aspartic acid, glutamic acid, asparagine, glutamine, etc.

The reason for limiting the isoelectric point of the amino acid used in the present invention to 7 or lower is that an amino acid with an isoelectric point higher than 7 cannot be dissolved in the amine oxide aqueous solution, so solids will be deposited.

The hair rinse composition of the present invention consists of an amine oxide represented by formula [I] and an amino acid with an isoelectric point of 7 or lower. The weight ratio of the amine oxide to the amino acid should be in the range of 1:0.01-2, or preferably in the range of 1:0.05-1. It is also possible to add perfumes, nutriments, thickeners, refrigerants, emulsifiers, and other components used for a normal hair rinse agent to the hair rinse composition of the present invention. Products can be manufactured by dissolving or dispersing the hair rinse composition in water or another solvent. When the hair rinse composition is dissolved or dispersed in water, the concentration of the amine oxide should be in the range of 0.5-10 wt%, or preferably in the range of 1-6 wt%.

In the present invention, the reason for using both the amine oxide represented by formula [I] and the amino acid with an isoelectric point of 7 or lower as the essential components is that if either of the components is used alone, the adsorption to the hair becomes weak. As a result, it becomes difficult to realize the effects required for a hair rinse agent, that is, to soften hair, to make hair easy to comb, to prevent static electricity, to make hair appear glossy, and to protect the hair surface.

As explained in the above, the amine oxide represented by formula [I] can be selected at will by varying R^1, R^2, R^3, m, and n. The amine oxides can be used either alone or as a mixture of several. The amino acids with an isoelectric point of 7 or lower can also be used either alone or as a mixture of several.

As explained in the above, the hair rinse composition obtained by mixing a specific amine oxide and a specific amino acid can soften hair, make hair easy to comb, prevent static electricity, make hair appear glossy, and protect the hair surface in a better way than a conventional cationic surfactant. The hair rinse composition of the present invention is an insignificant irritant. Also, no irritation occurs even when other alcohol-containing hair cosmetic products are applied to the rinsed hair.

In the following, this invention will be explained in more detail with reference to application examples. In these examples, % means wt%.

Application Example 1

Irritation from the hair rinse compositions containing the surfactants and amino acids listed in Table 1 (the remainder was ion exchanged water) as well as the irritation in the case when a hair tonic was applied after use of the aforementioned hair rinse compositions were evaluated by performing a patch test. The test was performed with 10 males and 10 females. To evaluate the irritation of a hair rinse agent, first, the hair rinse agent was applied to the hair, and the presence/absence of irritation was evaluated after 24 hours. To evaluate the irritation when a hair tonic is used, first, a hair rinse agent was applied to the hair. 12 hours later, the hair tonic was applied. Then, after another 12 hours, irritation was evaluated. The evaluation was performed based on how many people among the testees felt irritation. The number of the testees was used as the denominator, while the number of the people who felt irritation was used as the numerator. The results are listed in Table 1. For example, 0/20 means that among the 20 testees, the number of the people who feel irritation is 0.

Table 1

Irritation test results.

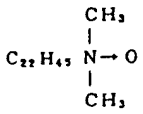
	試料	① 界面活性剤	② アミノ酸	③ ヘアーリンス剤の刺激性	④ ヘアートニック使用時の刺激性
⑧本発明品	1	$C_{16}H_{33}N^{+}(CH_3)_2O^{-}$ 3 %	⑤ グルタミン酸 0.5 %	0/20	0/20
	2	$C_{18}H_{37}N^{+}(CH_3)_2O^{-}$ 〃	〃	0/20	0/20
	3	$C_{22}H_{45}N^{+}(CH_3)_2O^{-}$ 〃	⑥ アスパラギン酸 0.5 %	0/20	0/20
	4	$C_{16}H_{33}N^{+}(CH_2CH_2OH)_2O^{-}$ 3 %	⑦ セリン 0.5 %	0/20	0/20
	5	⑨ ヤシアルキルジメチルアミンオキシド 1.5 % 硬化牛脂アルキルジメチルアミンオキシド 1.5 % ⑩	⑤ グルタミン酸 0.5 %	0/20	0/20
	6	$C_{12}H_{25}O(CH_2CH_2O)_2CH_2CH_2N^{+}(CH_3)_2O^{-}$ 0.5 % $C_{18}H_{37}N^{+}(CH_2CHOH)(CH_3)O^{-}$ 2.5 %	⑥ アスパラギン酸 0.3 % ⑪ グリシン 0.2 %	0/20	0/20
⑫比較品	7	$[C_{18}H_{37}N^{+}(CH_3)_2CH_3]Cl^{-}$ 3 %		1/20	4/20
	8	$[C_{18}H_{37}N^{+}(CH_3)_2CH_2C_6H_5]Cl^{-}$ 3 %		1/20	5/20
	9	$[C_{22}H_{45}N^{+}(CH_3)_2CH_3]Cl^{-}$ 3 %		1/20	3/20

Key:
1 Surfactant
2 Amino acid
3 Irritation from hair rinse agent
4 Irritation when a hair tonic is applied
5 Glutamic acid
6 Aspartic acid
7 Serine
8 Product of the present invention
9 Coconut alkyl dimethylamine oxide
10 Cured beef tallow alkyl dimethylamine oxide
11 Glycine
12 Comparative product

As can be seen from Table 1, none of the products of the present invention is an irritant. On the other hand, some testees who used the comparative products felt irritation.

Application Example 2

A cream rinse was prepared according to the following prescription.



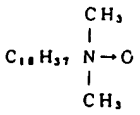
: 2.0%

Aspartic acid:	0.2%
Stearyl alcohol:	0.5%
Coloring material, perfume, preservative:	Appropriate amounts
Ion exchanged water:	97.3%

No irritation was observed for the obtained hair rinse composition, and no irritation was observed even when a hair cosmetic product containing a large amount of alcohol was used after the hair was rinsed with the aforementioned hair rinse composition. Also, the hair rinsed with the aforementioned hair rinse composition was soft, delicate, and very glossy.

Application Example 3

An oil rinse was prepared according to the following prescription.



: 2.0%

Polyoxyethylene(15)stearyl ether:	1.0%
Polyethylene glycol (MW=400):	2.0%

Glutamic acid:	0.2%
Coloring material, perfume, preservative:	Appropriate amounts
Ion exchanged water:	94.8%

No irritation was observed for the obtained hair rinse composition, and no irritation was observed even when a hair cosmetic product containing a large amount of alcohol was used after the hair was rinsed with the aforementioned hair rinse composition. Also, the hair rinsed with the aforementioned hair rinse composition was soft, delicate, and very glossy.

As a comparative example, the same test was performed using the same prescription except that glutamic acid was removed from the prescription used in Application Example 3. The same results as those of Application Example 3 were obtained for the evaluation on irritation. However, the effects of hair softening and making the hair look delicate and glossy were barely observed.

As can be seen from the results of the various application examples, the product of the present invention can be used as a hair rinse agent with excellent effects.